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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/675,557	09/30/2003	Terry L. Schneider	7784-000553CPC	6819
27572 7590 11/28/2007 HARNESS, DICKEY & PIERCE, P.L.C. P.O. BOX 828 BLOOMFIELD HILLS, MI 48303			EXAMINER CROUSE, BRETT ALAN	
			ART UNIT	PAPER NUMBER
			1794	
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			11/28/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/675,557

Applicant(s)

SCHNEIDER, TERRY L.

Examiner

Brett A. Crouse

Art Unit

1794

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 08 November 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,2,5-15,18-24 and 27-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,5-15,18-24 and 27-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |                                                                                                            |                                                                                         |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____                                                |

### DETAILED ACTION

This office action is in response to the amendment and request for continued examination, filed 8 November 2007, which amends claims 1, 14, and 22 and cancels claims 3, 4, 16, 17, 25, and 26. Claims 1, 2, 5-15, 18-24, and 27-29 are pending.

#### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 5, 6, 9 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by (Terasaka, US 5,770,305) hereinafter known as Terasaka.

As to claims 1, 2, 6, and 9:

Column 2, line 65 through column 3, line 9 with reference to figure 4, teach an anisotropic conductive film formed of an epoxy resin and contributing to adhesion.

Conductive particles dispersed in the resin can be Titanium – Nickel alloy.

Column 1, lines 13-24, teach the positioning of the anisotropic conductive film prior to the application of pressure. This is equated with providing the film when the particles are unstressed and thus austenitic.

The incorporation of shape memory particles in the resin of Terasaka is held to inherently improve an impact resistance of the resinous base material.

As to claim 5:

Column 2, line 65 through column 3, line 9 with reference to figure 4, further teaches that the alloy expands or contracts in response to stress and the alloy particles can be crushed due to stress. The various shaped encompassed by the base particles and stress induced deformations is held to encompass spheres, ovals, and cylinders.

As to claim 11:

Column 3, lines 17-18, teach that the particles have a mean particle size of 8 $\mu$ m.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various

claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 2, 5-15, 18-24, and 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over (Terasaka, US 5,770,305) hereinafter known as Terasaka, as applied to claims 1, 2, 5, 6, 9 and 11 above, as evidenced by <http://herkules.oulu.fi/isbn9514252217/html/x317.html>, Fundamental characteristics of nickel-titanium shape memory alloy, Oulun Yliopisto.

The teachings of Terasaka as in the rejection above are relied upon.

The limitation granules is held to be encompassed within the particle size distribution disclosure of a mean particle size of 8 $\mu$ m.

Terasaka does not teach the resin composition in the form of a paste. It would have been obvious to one of ordinary skill in the art at the time of invention to formulate the resin viscosity for ease of application.

Terasaka further does not teach an austenitic or martensitic crystal structure of the alloy. It is noted that a nickel-titanium alloy is inherently either in an austenitic or martensitic crystal structure dependent on temperature and the relative percentages of the constituent metals, as evidenced by Fundamental characteristics of nickel-titanium shape memory alloy, and it is therefore obvious that it will exist in the film or phase as such. Column 2, line 65 through

column 3, line 16, teaches that the ultra resilient alloy is in a compressed state due to stress acting upon it from the outside. As the resin expands due to a change in temperature thereby pushing the connection terminals upward the stress acting on the particles is reduced and the particles expand due to their righting force. The compressed state of the particles, prior to expansion embodies a martensitic state of the ultra resilient particles and the expansion of the particles due to the lower stress upon the particles, resulting from the expansion of the resin, results in the particles changing from the martensitic state to the austenitic state. Thus, during the course of operation of the ACF of Terasaka the ACF of Terasaka will materially embody all the elements of a base compound (resin) having a plurality of SMA particles dispersed therein, said SMA particles being in an austenitic state after expansion due to the reduction of stress upon the particles. The compression-after-impact performance will be a material characteristic of the combination of resin base compound and austenitic particles.

Terasaka further does recite a volume percent for amount of alloy within the resinous material. Column 3, lines 33-38 with reference to figure 5 teach that the alloy content of the resin is 3 weight percent. The density of nickel-titanium alloy is about  $6.5 \text{ g/cm}^3$  and the density of for example, phenolic resin is about  $1.25 \text{ g/cm}^3$ . This results in a volume percentage of about 0.58 percent. This teaching is held to suggest about 1 volume percent as required by claims 7, 8, 18, 19, and 28, which could be easily optimized by one of ordinary skill in the art.

Claims 1, 2, 5-15, 18-24, and 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamakawa et al., WO 03/102071 hereinafter known as Yamakawa.

Yamakawa teaches:

Paragraph [0005], teaches a composition comprising (A) a curable liquid polymer, (B) a shape-memory alloy filler, and (C) a thermoconductive filler.

Paragraph [0007], teaches that during the pre-curing, curing, or post-curing process it is necessary to raise the temperature above the transition point of the shape-memory alloy.

This is held to teach that the shape-memory alloy particles will be in the austenitic state.

Paragraph [0008], teaches the shape-memory alloy can be nickel-titanium. The paragraph also teaches that the shape-memory alloy can be in the form of particles. The average particle diameter is in the range of 5 to 500 microns. The paragraph additionally teaches it is recommended to use component (B), (shape-memory alloy), in an amount of 0.01 to 30 weight percent, preferably 0.1 to 20 weight percent.

Paragraph [0010], teaches the composition can be used as an adhesive or coating.

Paragraph [0022], teaches the composition functions as a protective layer and as an adhesive.

Yamakawa does not recite the resin composition having a consistency as a paste.

Yamakawa teaches that prior to curing the composition is flowable. It would have been obvious to one of ordinary skill in the art to adjust the viscosity of the flowable material in order to provide ease of application, including the form of a paste.

Yamakawa further does recite a volume percent for amount of alloy within the resinous material, instead teaching 0.01 to 30 weight percent. The density of nickel-titanium alloy is about  $6.5 \text{ g/cm}^3$  and the density of for example, phenolic resin is about  $1.25 \text{ g/cm}^3$ . This results in a range of volume percentages which overlaps the claim range of 1 to 50 volume percent of the instant invention.


Yamakawa does not recite the shape of the particles as spheres, ovals or cylinders, instead reciting fibers, flakes, scales, and plates. The teaching of fibers is equated with cylinders and spheres due to the teaching in paragraph [0008] of the diameters and lengths of the fibers. Additionally, the average diameter teaching with regard to plates is held as encompassing an oval.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brett A. Crouse whose telephone number is 571-272-6494. The examiner can normally be reached Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrell H. Morris can be reached on 571-272-1478. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/BAC/ 19 November 2007

  
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